

## Field Communication

**Metal-on-Metal Hips: Does Higher Activity Level = Higher Ion Levels?**

May-4-2005 — Derek Edgar

For decades, there has been much speculation and theoretical concern about extra terrestrials kidnapping humans to perform invasive medical experiments aboard spaceships. Similarly, alarmists in the medical community for years have perpetuated "theoretical concerns" about ion release in cobalt-chrome metal-on-metal articulations-despite the ever-increasing volume of literature showing that these concerns are just that: THEORETICAL.<sup>1-9</sup>

In the April 2005 issue of JBJS, Heisel, et al, report on a group of patients with metal-metal articulations they followed for two weeks to measure metal ions in the serum.<sup>10</sup> No other study of this type has ever been conducted.

During Week 1, the patients were instructed to limit their physical activity. But in Week 2, the authors increased the patients' activity level by >1,600%. Ten times during this two-week period, the authors measured serum (blood) ion levels in each of the patients for cobalt and chromium. So what do you think they found?

...[S]erum cobalt and chromium ion levels are minimally affected by activity," and "no correlation was found between baseline patient activity and serum levels of cobalt ( $r = 0.06$ ;  $p = 0.81$ ) or serum ( $r = 0.02$ ;  $p = 0.92$ ) or urine levels of chromium."<sup>10</sup> **In other words, ion levels stayed nearly constant during this two-week test. As usual, the ion levels seen were between 0.5 and 4.0ppb (parts per billion).**

So how can you put this article to work? Well, you might think of your surgeons as falling into one of three camps on metal-metal hips:

1. Believers
2. Skeptics
3. Antagonists

You've already convinced the Believers; it's just reinforcing the decision they've already made. And the Antagonists, they're probably just as happy to use your highly crosslinked poly. The guy who really needs your attention is the SKEPTIC. This is the surgeon who NEEDS LOTS OF REASONS TO USE metal-on-metal. So here is one more. And always remember that with the M2a-Magnum™ System, the important numbers are range of motion (>160 degrees) and stability (2.2cm average hop height).

To find out how to get a copy of this article, please call me, Derek Edgar, at ext. 1961 or email me at [derek.edgar@biometmail.com](mailto:derek.edgar@biometmail.com).

**References**

<sup>1</sup>Tharani, et al. The Risk of Cancer Following Total Hip or Knee Arthroplasty. JBJS, May 2001.

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Exhibit 25

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<sup>3</sup>Merritt, et al. Distribution of Cobalt Chromium Wear and Corrosion Products and Biologic Reactions. Clinical Orthop. 1996;329 Suppl:S233-243

<sup>4</sup>Shaffer, et al. Increased Blood Cobalt and Chromium After Total Hip Replacement. Clin. Toxicology, 1999 pp. 839-844

<sup>5</sup>Brodner, et al. Elevated Serum Cobalt with Metal-On-Metal Articulating Surfaces. JBJS 1997;79-B:316-21

<sup>6</sup>Kriebich, D, et al. Systemic Release of Cobalt and Chromium After Uncemented Total Hip Replacement. JBJS, (Br) 1996;78-B:18-21.

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<sup>9</sup>MacDonald, S, et al. Metal-on-Metal Versus Metal-on-Polyethylene Liners in Total Hip Arthroplasty: Clinical and Metal Ion Results of a Prospective Randomized Clinical Trial Abstract; Hip Society, Dallas, TX 2002.

<sup>10</sup>Heisel, et al. The Relationship Between Activity and Ions in Patients with Metal-on-Metal Bearing Hip Prostheses. J Bone Joint Surg Am. 87:781-787, 2005.

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